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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/609,989 | 06/30/2003 | Xiao M. Gao | ITL.0933US (P15730) | 1067 |

21906 7590 11/15/2007

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| EXAMINER | |
|---|---|
| JAMAL, ALEXANDER | |
| **ART UNIT** | **PAPER NUMBER** |
| 2614 | |
| **MAIL DATE** | **DELIVERY MODE** |
| 11/15/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/609,989 | GAO ET AL. | |
| | Examiner | Art Unit | |
| | Alexander Jamal | 2614 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *27 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,9-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

**1.** Based upon the submitted amendment, the examiner notes that claims 1,10,14 are amended and claims 6-8 are cancelled.

**2.** Examiner notes patent to Harnett (USRE39051E) that discloses using a fuzzy inference system to match impedances.

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims **1-18** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims recite determining a loop length and other characteristics. It is not clear what the "other characteristics' are. For the purpose of examination, examiner assumes the claims only recite determining the loop length.

### *Claim Rejections - 35 USC § 103*

1. Claims 1-5,9-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US2004/0101130A1), and further in view of Jeffery et al. (6970905).

As per **claim 1,** Shi discloses a system comprising a signal generator (inherently comprised in Xmit path 62 in Fig. 9D to provide the transmitted stimulus disclosed in page 11 paragraph 121), impedance mismatch hardware (switches 82a,82b,86a,86b) coupled to impedances R4,R3 in Fig. 9D), and a controller (DSP disclosed in page 12 paragraph 130) is used to measure subscriber loop characteristics to determine DSL capability (page 1 paragraph 3). Shi's system functions to maximize the received signal (para. 28), and uses the delay between the transmitted and received signals to determine the loop length (para. 26,27,38). However, Shi does not disclose that the DSP implements a fuzzy inference system.

Jeffery discloses a DSL system that monitors and analyzes measured conditions on the DSL line, including cable impedance and signal to noise ratio. Jeffery teaches that specialized logic, such as Fuzzy Logic may be used by the system in order to select the optimum configuration for the DSL modem (Col 15 lines 1-15). It would have been obvious to one of ordinary skill in the art at the time of this application to implement fuzzy logic in the controller of Shi for the purpose of providing the optimum configuration and results for the DSL tests. The DSP of Shi, when operating with fuzzy logic will be a fuzzy inference system.

As per **claim 10,** claim rejected for the same reasons as claim 1. FDR and TDR methods use the echo delay is used to determine the loop characteristics (page 11 paragraphs 119,121).

As per **claim 14,** it is rejected for the same reasons as claim 10. The DSP (page 11 paragraph 119) inherently comprises software for the purpose of controlling the hardware. The DSP controller of Shi in view of Jeffery's teachings, is a fuzzy inference system that adjusts the impedance seen by reflected signals by activating or deactivating (via switches) the hybrid or termination circuitry. This will function to modify the received signals because the impedance will be different.

As per **claim 2,** the impedance comprises a resistance (R3,R4).

As per **claim 3,** the system comprises an active termination impedance (page 11 paragraph 120).

As per **claim 4,** the receive signal the echo measured in either the FDR, or TDR method) is modified when the active termination impedance and hybrid are activated or deactivated (page 11 paragraphs120-124).

As per **claims 5,9,** the FDR and TDR tests measure the loop length and impedance which determine the ability to run a DSL on the loop (page 11 paragraph 119).

As per **claims 7,** the DSP controller is a fuzzy inference system that adjusts the impedance seen by reflected signals by activating or deactivating (via switches) the hybrid or termination circuitry. This will function to modify the received signals because the impedance will be different.

As per **claim 8,** FDR and TDR methods use the echo delay is used to determine the loop characteristics (page 11 paragraphs 119,121). The amplitudes and time delay of the reflected signals is measured (page 11 paragraph 121).

As per **claims 11,15,** claim rejected for the same reasons as claims 6-8.

As per **claim 12,** claim rejected for the same reasons as claim 5. Additionally loop taps may be determined via measurements of standing waves. The resonant frequencies will indicate loop taps (impedance mismatches), and the loop length, which itself is a determination of the loop impedance, which is an indication of the insertion loss.

As per **claim 13,** the loop characterisitics are used to measure subscriber loop characteristics to determine DSL capability (page 1 paragraph 3).

As per **claims 16-18,** claim rejected for the same reasons as claims 8,12,13.

**Response to Arguments**

**1.** Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

As per applicant's arguments that Shi does not disclose the new elements of the claims, examiner notes the cited portions of Shi in the claim 1 rejection.

**2.** Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Jamal whose telephone number is 571-272-7498. The examiner can normally be reached on M-F 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis A Kuntz can be reached on 571-272-7499. The fax phone numbers for the organization where this application or proceeding is assigned are **571-273-8300** for regular communications and **571-273-8300** for After Final communications.

Examiner Alexander Jamal

November 12, 2007

Melur Ramakrishnaiah

MELUR RAMAKRISHNAIAH
PRIMARY EXAMINER